



Fitbit One Teardown

Take apart the Fitbit One wireless activity and sleep tracker to see what is inside this cool fitness gadget.

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INTRODUCTION

The FitBit One is part of the family of fitness devices from FitBit Inc, designed to track your movement throughout the day and display the data via a website dashboard.

FitBit One is a wearable device that keeps track of the number and rate of steps you take and stairs you climb, and it uses this information to calculate various metrics like distance covered and calories burned. The device periodically sends the data it gathers to FitBit's servers via wireless communication with internet connected smartphones, iPads, or a PC with dongle.

There are a number of interesting features that warrant the teardown. It has a rechargeable battery that should power the device for about two weeks. It has a haptic alarm for time of day reminders. It has a bright LED display that shows the current statistics, and it is claimed to be sweat proof and rain proof, but not water proof. It also claims to remember minute-by-minute movement stats for up to seven days, and a summary of movement data for much longer.

Time to open it up and see what's inside this mighty machine.



TOOLS:

- [Precision Utility Knife](#) (1)
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Step 1 — Fitbit One Teardown



- Removing the metal backplate is simple. This is just stuck on with some flexible glue. So prise something under and off it pops.
- Inside you can see a number of large cut outs in the rear of the plastic casing.
- Note the small pinhole in the metal backplate that aligns with the rubber sealed hole in the plastic casing - more on that later.
- There is also a very small ground out area inside the metal backplate that appears to align with the rotating mass of the vibrator.

Step 2



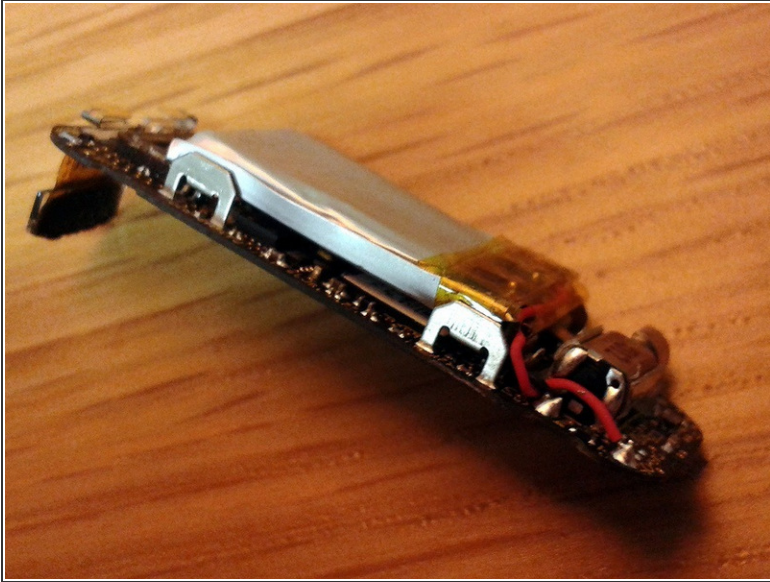
- The plastic casing is made up of two parts stuck together, so using a scalpel carefully cut along seam
 - There are plastic clips at each end that are easy to cut through inadvertently if you go too deep.
- The front now lifts away cleanly.

Step 3



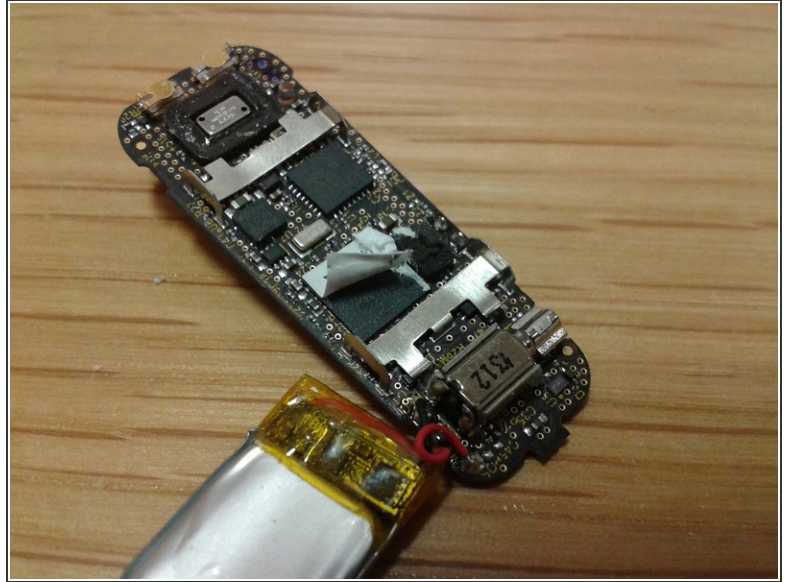
- Inside the front cover you see the LCD display, attached by ribbon cable and stuck firmly onto the PCB.
- Above the display, running down the right hand side of the device front, is the [BLE](#) antenna.
- Lifting the LCD glass just results in destroying it, and there is nothing interesting underneath anyway.

Step 4



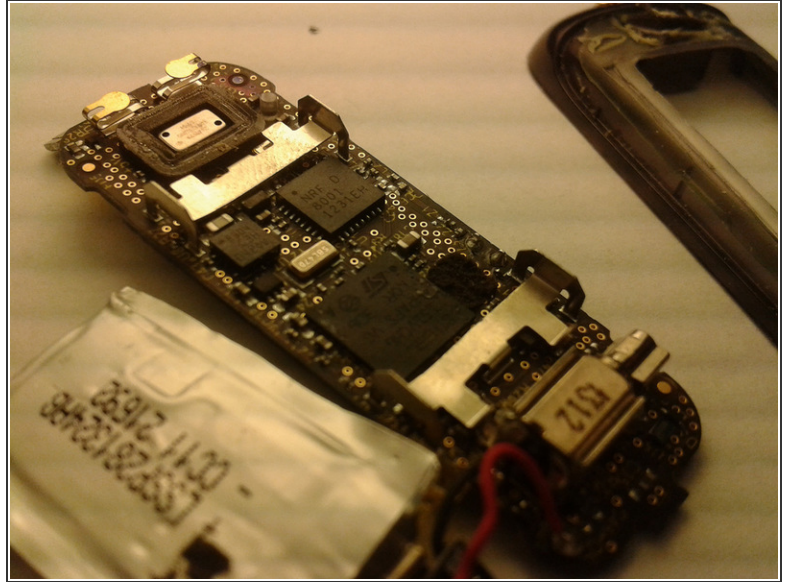
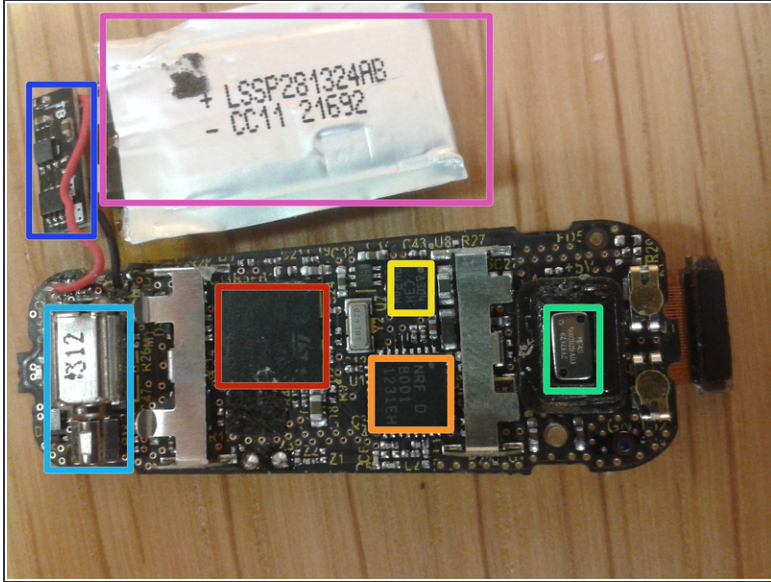
- The PCB lifts out from the back of the plastic housing easily.
- Notice how the battery is supported on stand-offs from the rear of the PCB.
- The battery is held in place with a small foam block adhering to the battery and PCB. Cut that away and the battery lifts off.

Step 5



- Now we get to see some more interesting parts.
- The [SoC](#) has a [QR code](#) sticker, likely for inventory control, so take that off to see what we have underneath.
- You can also see the spring-loaded paddles at the bottom of the PCB that connect to the device charging pins.
- The power control module for the battery is wrapped up near the battery terminals.

Step 6



- Here we get a good view of what's inside:
 - [STMicroelectronics STM32L 151](#) ARM-based SoC microcontroller
 - [Nordic Semiconductor nRF8001](#) Bluetooth chip
 - Accelerometer labelled 8304 AE D42 oW
 - [Measurement specialities MS5607-02BA03](#) altimeter
 - Protection circuit module for battery
 - Polymer Li-Ion Battery
- PCB mounted vibration motor

Step 7



- The air pressure hole, required for the altimeter, is protected by a piece of paper held in place by a foam collar.
- In turn, the inside of the plastic cover presses onto a foam collar around the altimeter on the PCB.
- This makes the device sweat proof, but not water tight.

Step 8



- Too bad the display was damaged during teardown.
- Looks like a tidy, well-designed bit of tech!
- Conclusion is that the FitBit One is not an easily repairable device.
 - The device is not designed to be opened, so you will do some damage by cutting it open
 - Taking things apart will compromise the water resistance of the device, and the LCD display is easily broken by any flexing or attempts to modify.

To reassemble your device, follow these instructions in reverse order.

This document was last generated on 2017-06-19 04:34:31 PM.